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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/714,457	11/17/2003	Hong-seok Lee	277/026	2497

7590 04/22/2005

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EXAMINER

PAK, SUNG H

ART UNIT PAPER NUMBER

2874

DATE MAILED: 04/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

11.9

<b>Office Action Summary</b>	Application No. 10/714,457	Applicant(s) LEE ET AL.	
	Examiner Sung H. Pak	Art Unit 2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1004</u> . | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

Information disclosure statement filed 10/28/04 has been considered by the examiner.

### ***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Cotteverte et al (US 2002/0048422 A1).

Cotteverte discloses an optical device with all the limitations set forth in the claims, including: A 2x2 optical switching apparatus using photonic crystal structures, the apparatus comprising: an optical-guide module having a first, a second, a third and a fourth waveguide (Fig. 28, Fig. 30, Fig. 31), the first and the second waveguides guiding a first optical signal of a first input port to a first and a second output port, respectively (Figs. 30, 31), the third and the fourth waveguides guiding a second optical signal of a second input port to the second and the first output ports, respectively (Fig. 30, 31), and formed with photonic crystals having a complete

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photonic bandgap for a wavelength range of the first and the second optical signals (paragraph 0087); and a switching control section controlling the first and the second optical signals to be respectively guided through any one route of a first/third waveguide route and a second/fourth waveguide route, according to a route-selecting-control signal inputted from outside the 2x2 optical switching apparatus (Figs. 28-31, paragraph 0091);

wherein the optical-guide module and the switching control section are formed as a single body (Fig. 28);

wherein the switching control section comprises: a first pair of switching-control segments wherein each one of the first pair is positioned in an inner area of a respective one of the first and the third waveguides; and a second pair of switching-control segments wherein each one of the second pair is positioned in an inner area of a respective one of the second and the fourth waveguides; wherein any one pair of the first pair and the second pair of switching-control segments is selectively operated according to the route-selecting-control signal (Fig. 30-31, paragraph 0091);

wherein the switching control section further comprises: a photonic crystal having a controllable photonic bandgap, and a refractive index changing section for varying a refractive index of an inner substance of the photonic crystal according to the route-selecting-control signal (paragraph 0087);

wherein the refractive index changing section comprises: a temperature control section for outputting temperature control signals for controlling a temperature of the inner substance of the photonic crystal according to the route-selecting-control signal, and at least one heating

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device for changing the temperature of the inner substance of the photonic crystal according to the temperature control signals (paragraph 0017);

wherein the refractive index changing section comprises: an electric field control section for outputting electric field control signals for controlling an electric field intensity of the inner substance of the photonic crystal according to the route-selecting-control signal, and at least one electric plate for controlling an electric field of the inner substance of the photonic crystal according to the electric field control signals (paragraph 0016);

wherein the refractive index changing section comprises: an optical intensity control section for outputting optical intensity control signals for controlling an intensity of optical signals to be applied to the inner substance of the photonic crystal according to the route-selecting-control signal, and at least one optical source for applying optical signals having the intensity corresponding to the optical intensity control signals to the inner substance of the photonic crystal (paragraph 0070-0071);

wherein the switching control section further comprises: two pairs of photonic crystals having a complete photonic bandgap for a wavelength range of the first and the second optical signals, and a drive section for inserting and removing the two pairs of photonic crystals into and from the first, the second the third and the fourth waveguides, respectively, according to the route-selecting-control signal (paragraph 0087);

wherein the drive section for inserting and removing the two pairs of photonic crystals inserts each one of one pair of the photonic crystals into a respective one of each of the first and the third waveguides, and removes each one of the other pair of the photonic crystals from each of the second and the fourth waveguides, respectively (Fig. 30-31, paragraphs 0087, 0091);

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wherein the drive section for inserting and removing the two pairs of photonic crystals removes each one of one pair of the photonic crystals from each of the first and third waveguides, respectively, and inserts each one of the other pair of photonic crystals into a respective one of each of the second and the fourth waveguides (Fig. 30-31, paragraphs 0087, 0091).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sung H. Pak whose telephone number is (571) 272-2353. The examiner can normally be reached on Monday- Friday, 9AM-5PM.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sung H. Pak  
Examiner  
Art Unit 2874